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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/714,179

11/14/2003

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9391

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09/29/2008

EXAMINER

KAWSAR, ABDULLAH AL

ART UNIT

PAPER NUMBER

2195

MAIL DATE

DELIVERY MODE

09/29/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/714,179	<b>Applicant(s)</b> CERVINI, STEFANO	
	<b>Examiner</b> ABDULLAH AL KAWSAR	<b>Art Unit</b> 2195	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-7,9-21 and 23-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7,9-21 and 23-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

1. Claims 1-7, 9-21 and 23-28 are pending.

***Continued Examination Under 37 CFR 1.114***

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/09/2008 has been entered.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 6-7, 9-10, 13-17, 20-21, 23-24, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilkinson et al.(Wilkinson) US Patent no. 6094715, in view of Lorie et al.(Lorie) US Patent No. 4435758.

5. Wilkinson was cited in the previous office action.

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6. As per claim 1, Wilkinson teaches the invention as claimed including an apparatus for executing at least one single multiple data (SPMD) program in a microprocessor, said apparatus comprising:

a micro single instruction multiple data (SIMD) unit associated with a microprocessor (col 7, lines 25-27); and

a job buffer (BCI buffer) having an output coupled to an input of said SIMD unit (PME) (col 24, lines 49-55),

Wilkinson does not specifically disclose wherein said job buffer dynamically bundling jobs into a task based on a control flow equivalence of said jobs and allocates said task to said micro SIMD unit, said control flow equivalence including concurrent execution of an instruction stream by said plurality of jobs.

However, Lorie teaches wherein said job buffer dynamically bundling jobs into a task based on a control flow equivalence of said jobs and allocates said task to said micro SIMD unit, said control flow equivalence including concurrent execution of an instruction stream by said plurality of jobs (figure 1; col 8, lines 36-69 through col 9, lines 1-5; col 1, lines 32-45; col 3, lines 42-48).

7. It would have been obvious to a person of ordinary skill in art at the time of invention was made to incorporate the teaching of Lorie into method of Wilkinson to dynamically bundle the jobs into a task based on control flow equivalence and concurrent execution of the instruction stream. The modification would have been obvious because one of the ordinary skills of the art

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would execute the job bundled with same control flow to minimize the inter-processor communication.

8. As per claim 2, Wilkinson teaches said micro SIMD unit is capable of sending job status information to said job buffer (col 73, lines 1-4; col 48, lines 28-30).

9. As per claim 3, Wilkinson teaches said at least one SPMD program comprises a plurality of input data streams having moderate diversification of control flows (col 8, lines 25-29).

10. As per claim 6, Wilkinson teaches said apparatus executes a plurality of SPMD programs and wherein each SPMD program of said plurality of SPMD programs is executed on a number of input data streams ( col 8, lines 19-2).

11. As per claim 7, Wilkinson teaches said number of input data streams is greater than a program granularity threshold (col 41, lines 24-36).

12. As per claim 9, Lorie teaches said apparatus performs job clustering to form a job bundle in which each job in said job bundle has an equivalent control flow (col 1, lines 32-45).

13. As per claim 10, Wilkinson teaches said apparatus performs said job clustering based on a job processing status of said jobs in said job bundle (col 21, lines 9-11).

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14. As per claim 13, Lorie teaches said apparatus maximizes a size of a job cluster by selecting tasks for execution in which a job processing status of each of said tasks is complete (col 8, lines 51-67).

15. As per claim 14, Wilkinson teaches said apparatus executes a data loading phase for a task before said apparatus executes a task execution phase for said task (col 24, lines 2-8; lines 17-26).

16. Claims 15-17, 20 and 21 are system claims of claims 1-3, 6 and 7 above. They are therefore rejected under the same rational.

17. As per claims 23, 24, 27 and 28, they have similar limitations as of claims 9, 10, 13 and 14 above. Therefore, they are therefore rejected under the same rational of claims 9, 10, 13 and 14 above.

18. Claims 4, 5, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilkinson et al.(Wilkinson) US Patent no. 6094715, in view of Lorie et al.(Lorie) US Patent No. 4435758, as applied to claims 1 and 15 above, and in view of Pechanek et al. US Patent No. 6,470,441 B1.

19. As per claim 4, Wilkinson does not specifically discloses apparatus executes said at least one SPMD program once for each input data stream of said plurality of input data streams.

20. However, Pechanek teaches said apparatus executes said at least one SPMD program once for each input data stream of said plurality of input data streams (col 4, lines 62-65).

21. It would have been obvious to a person of ordinary skill in art at the time of invention was made to incorporate the teaching of Pechanek into combined method of Wilkinson and Lorie to execute SPMD once for each data stream. The modification would have been obvious because one of the ordinary skills of the art would have a SPMD program execution once for each data input stream as it would reduce the latency of process execution.

22. As per claim 5, Wilkinson teaches said apparatus generates an instruction stream for each input data stream of said plurality of input data streams (col 8, lines 25-28).

23. As per claims 18 and 19, they have similar limitations as of claims 4 and 5 above. Therefore, they are therefore rejected under the same rational of claims 4 and 5 above.

24. Claims 11, 12, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilkinson et al.(Wilkinson) US Patent no. 6094715, in view of Lorie et al.(Lorie) US Patent No. 4435758, as applied to claims 1 and 15 above, and further in view of “Multi-thread VLIW processor architecture for HDTV decoding” by Hansoo Kim(Kim).

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25. As per claim 11, Wilkinson and Lorie do not specifically disclose forces a task to terminate at a point where a job control path might fork by placing a code-stop.

26. However, Kim teaches said apparatus forces a task to terminate at a point where a job control path might fork by placing a code-stop in said task (page 3, col 1, lines 3-8, “the program can ..... entries exceeds a predefined number.”)

27. Therefore, it would have been obvious to a person of ordinary skill in art at the time of invention was made to incorporate the teaching of Kim into the combined method of Wilkinson and Lorie to have a task termination point to switch task. The modification would have been obvious because one of the ordinary skills of the art would have a task switch to fulfill special conditions of system execution and prioritize execution.

28. As per claim 12, Kim teaches said apparatus minimizes a required number of code-stops to be placed in said task by excluding from code-stop placement each control flow statements that is equivalent to a select instruction (page 3, col 1, lines 3-8, “the program can ..... exceeds a predefined number.”).

29. As per claims 25 and 26, they have similar limitations as of claims 11 and 12 above. Therefore, they are therefore rejected under the same rational of claims 11 and 12 above.



***Response to Argument***

30. Applicant's arguments filed 06/09/2008 have been fully considered but they are not persuasive.

31. In the remarks applicant argues that:

(1) Wilkinson fails to teach having an output coupled to an input of a SIMD unit..

32. Examiner respectfully disagree to applicant:

i. As to points (1), applicant supports his argument with mentioning that the cited portion of Wilkinson fails to show any job buffer and having a SIMD unit connected to the job buffer. Examiner respectfully disagrees with the applicant. Wilkinson teaches a PME(SIMD unit) which is capable of executing in SIMD mode. When the PME is executing in SIMD mode it receives instruction through the BCI bus. BCI buffers(job buffer) the data until PME have executed the instructions which means the BCI buffer sends the instructions to the PME through the BCI bus and the output of the BCI buffer broadcasts the instructions to the PME input for processing through the BCI bus (Wilkinson, col 24, lines 48-55).

***Conclusion***

33. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ABDULLAH AL KAWSAR whose telephone number is (571)270-3169. The examiner can normally be reached on 7:30am to 5:00pm, EST.

34. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng Ai T. An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

35. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Meng-Ai An/  
Supervisory Patent Examiner, Art Unit 2195

/Abdullah-Al Kawsar/  
Examiner, Art Unit 2195